

CLAIMS

I claim:

1. An apparatus for dispensing detergent into a warewasher which has wash cycle, said apparatus comprising:

a reservoir for containing the detergent;

a flow control device which couples the reservoir to the warewasher and

5 controls flow of the detergent into the warewasher;

a sensor which produces a signal indicating an amount of detergent present in water within the warewasher; and

a controller operatively connected to the flow control device and the sensor to control dispensing detergent into the warewasher, wherein the controller has a first
10 mode of operation in which a quantity of detergent dispensed into the warewasher is determined in response to the amount of detergent indicated by the sensor, and has a second mode of operation in which a predefined quantity of detergent is dispensed into the warewasher, the controller switching between the first and second modes in response to a determination regarding reliability of operation of the sensor.

2. The apparatus as recited in claim 1 wherein the sensor detects electrical conductivity of water within the warewasher.

3. The apparatus as recited in claim 2 wherein the controller switches between the first and second modes in response to an amount that the electrical conductivity changes.

4. The apparatus as recited in claim 2 wherein the controller switches between the first and second modes in response to a comparison of a plurality of conductivity measurements provided by the sensor.

5. The apparatus as recited in claim 2 wherein the controller switches from the first mode to the second mode when the electrical conductivity fails to change by at least a predetermined amount in response to detergent being dispensed to the warewasher.

6. The apparatus as recited in claim 2 wherein the controller switches from the second mode to the first mode when the electrical conductivity changes more than a predetermined amount.

7. The apparatus as recited in claim 2 wherein the controller employs the electrical conductivity to derive a value indicating concentration of the detergent present in the water.

8. The apparatus as recited in claim 7 further comprising a storage device connected to the controller and storing a designation of a desired level of detergent concentration; and wherein the controller determines the quantity of detergent to dispense in response to comparing the level of concentration of the detergent derived by the controller to the desired level of detergent concentration.

9. The apparatus as recited in claim 1 further comprising a storage device connected to the controller and storing a designation of a desired amount of detergent; and wherein the controller determines the quantity of detergent to dispense in response to comparing the amount of detergent present in the water to the desired amount of detergent.

10. The apparatus as recited in claim 1 wherein the controller operates the flow control device to dispense detergent in response to the warewasher operating in the wash cycle.

11. The apparatus as recited in claim 1 further comprising an input device connected to the controller and enabling an operator to specify the predefined quantity of detergent.

12. The apparatus recited in claim 1 wherein the flow control device is a pump.

13. The apparatus recited in claim 1 wherein the flow control device is a valve.

14. An apparatus for dispensing detergent into a warewasher which has wash cycle, said apparatus comprising:

a reservoir for containing the detergent;

a flow control device which couples the reservoir to the warewasher and

5 controls flow of the detergent into the warewasher; and

a sensor that measures electrical conductivity of water within the warewasher;

and

a controller connected to the sensor and operating the flow control device

to dispense detergent into the warewasher, the controller has a first mode of

10 operation in which a quantity of detergent dispensed into the warewasher is

determined in response to the electrical conductivity of the water, and has a

second mode of operation in which a predefined quantity of detergent is

dispensed into the warewasher, wherein the controller switches between the first

and second modes in response to a determination regarding reliability of electrical

15 conductivity measurements provided by the sensor.

15. The apparatus as recited in claim 14 wherein the controller switches between the first and second modes in response to a comparison of a plurality of electrical conductivity measurements provided by the sensor.

16. The apparatus as recited in claim 14 wherein the controller switches from the first mode to the second mode when the electrical conductivity fails to increase at least a predetermined amount upon detergent being dispensed into the warewasher.

17. The apparatus as recited in claim 14 wherein the controller switches from the second mode to the first mode when the electrical conductivity increases by at least a predetermined amount.

18. The apparatus as recited in claim 14 wherein the controller in the first mode employs the electrical conductivity to derive a level of concentration of the detergent present in the water, and determines the quantity of detergent to dispense in response to comparing the level of concentration of the detergent to a desired level of detergent concentration.

19. The apparatus as recited in claim 18 further comprising an input device connected to the controller and enabling an operator to specify the desired level of detergent concentration.

20. The apparatus as recited in claim 14 further comprising an input device connected to the controller and enabling an operator to specify the predefined quantity of detergent.

21. The apparatus as recited in claim 14 wherein the controller operates the flow control device to dispense detergent in response to the warewasher operating in the wash cycle.

22. A method of dispensing detergent into a warewasher which has wash cycle, said method comprising:

storing detergent in a reservoir;

coupling the reservoir to the warewasher by a flow control device which

5 controls flow of the detergent into the warewasher;

sensing electrical conductivity of water within the warewasher to produce a conductivity measurement;

determining reliability of the conductivity measurement;

when the conductivity measurement is determined to be reliable, dispensing a

10 quantity of detergent into the warewasher wherein the quantity is determined in response to the electrical conductivity of the water; and

when the conductivity measurement is determined to be unreliable, dispensing a predefined quantity of detergent into the warewasher.

23. The method as recited in claim 22 wherein the conductivity measurement is determined to be unreliable when the electrical conductivity fails to change at least a predetermined amount in response to detergent being dispensed into the warewasher.

24. The method as recited in claim 22 wherein the conductivity measurement is determined to be reliable when the electrical conductivity changes more than a predetermined amount.

25. The method as recited in claim 22 further comprising employing the conductivity measurement to derive a level of concentration of the detergent present in the water, and determining the quantity of detergent to dispense in response to comparing the level of concentration of the detergent to a desired level of detergent concentration.

26. An a control system for dispensing detergent into a warewasher which has a reservoir for containing the detergent, said control system comprising:

a flow control device which couples the reservoir to the warewasher and controls flow of the detergent into the warewasher;

5 a sensor which produces a signal indicating an amount of detergent present in water within the warewasher; and

a controller operatively connected to the flow control device and the sensor to control dispensing detergent into the warewasher, wherein the controller has a first mode of operation in which a quantity of detergent dispensed into the warewasher is
10 determined in response to the amount of detergent indicated by the sensor, and has a second mode of operation in which a predefined quantity of detergent is dispensed into the warewasher, the controller switching between the first and second modes in response to a determination regarding reliability of operation of the sensor.

27. The apparatus as recited in claim 26 wherein the sensor detects electrical conductivity of water within the warewasher; and the controller switches between the first and second modes in response to the electrical conductivity.